

Modelling of Pickup Ion Distributions in the Halley Cometary Sheath

D E Huddleston, M Neugebauer, B E Goldstein (Jet Propulsion
Laboratory, California Institute of Technology, 4800 Oak Grove
Drive, Pasadena, CA 91109; 818-354-7893;
dhuddleston@jplsp.jpl.nasa.gov)

in the cometary sheath, the center-of-mass plasma frame is approximately the bulk flow velocity of the implanted water group ions. The peaks of the observed Giotto IMS water group ion velocity distributions are consistent with scattering to a bispherical shell in the distance range 1.8 to 1.2×10^5 km from the Halley nucleus. Successive distributions on approach to the comet show significant losses of ions at energies above the injection peak. Velocity diffusion and other acceleration processes act to broaden the distribution while loss mechanisms deplete the densities of ions particularly at high energies. These effects are modelled. The loss rates appear to be faster than can be explained by re-neutralization due to recombinant ion and charge exchange processes with the usual cross-sections. Empirical estimates for a production rate of fast neutrals are obtained.

1. 1993 Fall Meeting
2. 012748407
3. (a) D E Huddleston
MS 169-506
JPL/Caltech
4800 Oak Grove Dr.
Pasadena, CA 91109
(b) (818) 354-7893
(c) (818) 354-8895
4. P
5. (a) P03 Recent Results on
Asteroids and Comets
(b) 6025 interactions with
solar wind plasma and fields
7867 wave-particle
interactions
2756 magnetospheres
6. Oral
7. 20% JGR in press
8. \$50 Check enclosed
9. C
10. None
11. No